ZX-Appeal

vancouver sinclair users group

next meeting:

KILLARNY COMMUNITY CENTRE
6260 KILLARNY STREET
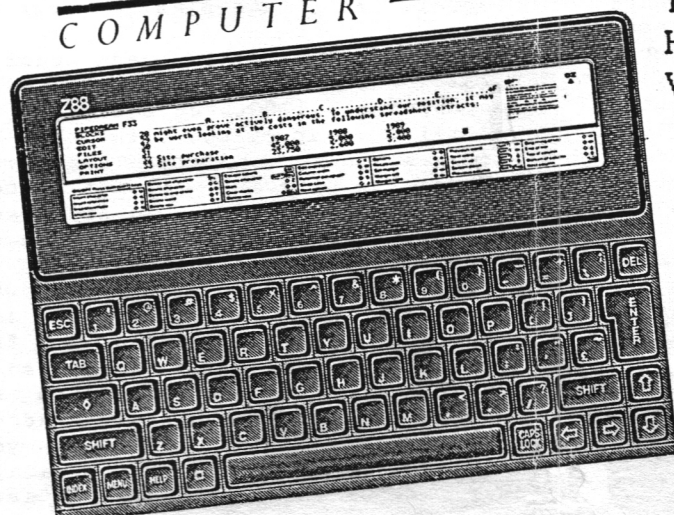VANCOUVER

FRIDAY; 7:00PM

MARCH 11

ZXAppeal is a monthly
newsletter put out by the
Vancouver Sinclair Users Group.
For more information on the
group and ZXAppeal see the backcover.

Feature Report

CAMBRIDGE COMPUTER **Z88**

inside

As we arise from our winter hibernation we come upon another issue of our trusty newsletter. I hope you took advantage of the quiet of winter to get in some solid undisturbed computin'. Maybe getting a handle on that word processor or beating your favourite game.

I knew it - take a month off grumbling about the lack of material and more good stuff turns up than might fit in one issue: Ever prolific Fred Nachbaur sent in a whole bunch of great items. Fred tells us about the "ZX Term Exchange" on the NNN. Also his "Ultimate Orphan", his Member Profile, and finally a surprise gift for all the members. Speaking of Profiles, Chung Chow gives us his also. Sir/Uncle Clive stops by with an interview on how he sees the future and we also have a review of the Z88, Clive's latest. Doug Jeffery sent in a really helpful article on just "Poking Around". Tim Stoddard gives us a NEAT hardware project for the ZX81 - a REAL TIME CLOCK. Bill Rutter advises novice Hackers on the fine points of program hacking. And what issue would be complete without one of Harvey's "Playing With..." gems. All this and if space allows, a lot more.
****

Last issue I raised the question of whether our group could produce enough material to sustain a monthly newsletter or would it be better to go to a bi-monthly format to retain a quality newsletter. I received little feedback from members at large but I did get some that caused me to see this question from another perspective. That is "What is the real purpose of the newsletter?" The newsletter should tell the members the latest news and happenings, the minutes of the last meeting, and the date of the next. With that as the main objective of this endevour we're going back to a monthly format. This will probably mean the newsletter will be skinny one month and, hopefully, fatter the next.
****

...word is that another publication is starting up. QL USA will be devoted to the QL and is said to be aimed at the full range of users - novice to hacker. That's the second publication to be launched in the last while. 2068 UP-DATE skippered by VSUG member Bill Jones is off to a strong start. 2068 UP-DATE is primarily for user's with disc mass storage - all formats, but would also be very interesting and useful to all users. Bill has committed to putting out a year of quarterly issues and will only then take a look at the balance sheet. These guys are taking the gamble on US so let's back'em up!
...it can be reported that Dan Elliot offers and provides a first class service. Dan was sent two Memotech Centronic printer interfaces for repair. It was said these things were a nightmare to even attempt a repair on. Dan had them both back fully operational in no time. He even refunded a portion of the repair fee - said he was sent TOO MUCH! Dan is presently dickering with Portugal on a bulk buy of SCLD chips. He wants to sell half the order to recoup his costs and hold the balance for repairs. He'll contact us when the time is right.
...Electronic Surplus Inc., 1224 Prospect Ave., Cleveland, OH, 216-621-1052, has a really super bargain going: a 1500 plus a 2040 printer for $30.00US. This is half the price advertised by American Design in the back of Computer Shopper. They take plastic over the phone.
...apparently a 1000 and Memotech RS232 interface combo will allow hookup with a 1200 baud modem.
...Bill Harmer of the Ottawa Support Unit has just completed some very interesting software for the 1000: Helpmate I combines a word processor, adding machine, calculator, columnar pad, and memo/note database.
...Jack Dohany of Jack's Fairware fame has a new catalog out. Jack reports he is taking a year off from his regular source of income so he can devote himself fulltime to his ever expanding stable of wondrous programs for the 2068. Anyone interested in seeing Jack's catalog just ask at the meeting. We'll get a

chance to meet with Jack at the Portland ´Fest in August as he´ll be coming up from Ca.
...Clifford & Grey still offer 5 modem boards for $15.00US. These boards are without cable but are a good source of repair parts or better yet don´t repair the old board - just put the old cable on the new board. The large blueprint schematic of the 2068 makes a great wall poster when laminated.
...VSUG Member Ian Robertson reports hearing of a SPECTRUM clone: 32K ROM, 128K of bank-switched memory, proper keyboard, and maybe BETA BASIC as the O/S, all run by a Z80B @ 6mhz. What goes round, comes round!
...Broadway Computing at Broadway and Fraser has the Admate DSY-80 daisy wheel printer for $199.00. This printer is a beauty - fast and quiet. Hook up and run on the QL without doing anything - just turn it on and print in perfect letter quality. *Includes sheet feeder & tractor feed!*
****

RENEWING MEMBERS:

Bob Dick, Harry Slot
Dan Pinko, Marcio Vieira
Bob Denison, Doug Jeffery
George Pattison, Bill Jones

NEW MEMBERS:

Tim Woods, Colton, Oregon
Ken Davis, Vancouver, B.C.

IF YOU GET THE DREADED EXPIRY NOTICE BE SURE TO RENEW AT THE MEETING.
=======================================

...meeting date:

MARCH / 88						
SUN	MON	TUE	WED	THU	FRI	SAT
✳	✳	1	2	3	4	5
6	7	8	9	10	**11**	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	✳	✳

From your Vice-Prez.....

As a computer owner/user, I place myself in the large group that simply wish to use the most-suitable and cheapest combination of software and hardware available to do some specific task, which for me usually involves spread sheets or word processing programs with the occasional use of a data base.

I will admit that my knowledge of electronics is limited to changing light bulbs, that I couldn't tell a resistor from a capacitor even if one chased the other up a tree, and that I have never owned a soldering iron in my life.

Several years ago when I bought my first computer, a TS1000, I did manage to learn and use a smattering of BASIC because that was the way it seemed things should be done in those days. But I soon learned there were others out there who could produce far better programs than I, and who were quite happy to give them to you to use, or at least sell them quite cheaply.

To use such programs, I may have had to modify my way of thinking and doing things, just as my computer forced me to, but it was still better than writing and de-bugging them myself.

These attitudes have prevented me from becoming "married" to any one program or system, and when an opportunity for something better has come up that my wallet could handle, I have taken it and "moth-balled" my old stuff.

Thus, when I spotted a new TS2086

at a good price at a flea market, I bought it, soon acquired some software for it, and retired my TS1000. Similarly, when our club organized the group purchase of the QL kits, I ordered one (was pleased to receive an assembled QL because they had run out of kits), soon acquired some software, and then retired my TS2086.

The strength of our club is based not only on the varied experiences and abilities of its members, but on the willingness of each member to share knowledge with others and to assist both other members and the club in general.

My only strength is my use of all three Sinclair systems, but that has not prevented me from standing as your Vice-President for the last two years. I have been pleased to give such assistance as I could to our able President Ken, and to assist the growth of our TS1000 and 2086 tape and book libraries even though I'm currently a QL user only.

Ken has already announced that he won't be able to carry on as President for another year. I must tell you now that I cannot stand for any position this year either.

I hope all of you will consider your own experience and that some of you will agree to fill these vacant positions.

Remember, it's your club and the club is only what you help make it.

Minutes Jan 8/88
- by your humble scribe

The meeting opened at 19:23 with 21 souls present; a couple straggled in later. We were moved to a new room by the folks at the community centre, but people seemed to find their way with no problem. There were no gymnastics overhead, which was a bit of a relief.

Ken started off by telling us that the San Francisco fair and the Pacific North West computer fair had been amalgamated into the West Coast Computer Fair & is to held Aug/88 in Portland, Oregon.

Ken was then looking for help with xeroxing of the Pete Fisher telecomm book. If anybody locally is able to help (or wants a copy) contact Ken.

It seems the skytrain tour was a washout. Five minutes before the tour was scheduled to occur, there was some unspecified emergency & the control room was suddenly verboten to the great unwashed, particularly of the computing variety. The tour is to be rescheduled. The only times available are 08:30 -> 16:00, so some people won't be able to make it. However Ken will be on the blower to those on his list.

Gerd B. told us about a great new xmas present from Fred Nachbaur, namely Invaders. Look for kudos from Gerd. Gerd then moved a motion that becuase of his continuing support for the Sinclair computer & his extra-ordinary level of contributions to the club that Fred Nachabur be given a free full page ad in a future edition of ZXAPPEAL. The motion passed unanimously.

Ken had come to the meeting prepared to berate us for the slovenly bunch of keyboard addicts we are, as well as for never bringing in our systems or doing demos, but Harvey had brought his QL & digitizer - so the berating was delayed. Prepare your weary nerves.

Instead Ken treated us to a display of computer furniture a la cheapskate. The next installment of How to Deal with Computer Widows turned out to be buy her a computer of her own. To be continued.

Rusty, the VP, then had his kick at the can flogging QL raffle tickets & the SyncWare News book.

He has a TS1000, he picked up at an auction, for sale.

Ken had brought a Seiko wrist watch/ computer which he showed to those present. He also brought a Z88 spec sheet which he passed around.

Rod Humphreys, Treasurer & Editor emeritus, had laryngitis as a result of the flu & consequently his BOMBSHELL announcement went by with little or no comment. Because of a low level of contributions, ZXAPPEAL is going bi-monthly. See the BBS discussion tacked on below. Later on Rod told us we have $775.00 + 1 QL to our credit.

Ken then told us of the overhead projection device he had seen. It consisted of an LCD which went where a transparency normally would on an overhead projector & allowed on to put computer graphics/text on the wall. Someone commented that at US$1400.00 and up it was just what you needed for a $15.00 computer.

Ian, the TS1000 librarian, stood to say he was willing to do a demo, but somebody would have to bring a TV for him. There was then some discussion of a couple of missing programs which he thought Fred N. had donated, but there was some question about their status & at any rate Gerd has backups of everything. They will work it out.

Bill, the 2068 librarian, told us that a bunch of the Cleveland tapes were unusable, with only a couple of programs being salvageable on a side. We have received tapes from CATS (Capitol Area TS) and Toronto to bring our 2068 library up to 43 tapes.

Kevin Kerney, the paper librarian, couldn't make it.

Harry Slot stood to tell us that the Hardware SIG had been quiet lately. At this point, it became clear that Harry is the kind of person who likes to be mysterious. He told us that the Hardware SIG was involved in a secret PC8300 project about which he could tell us nothing. His eyes fairly danced. Stay tuned. He also told us that he had some 32K boards, pre-drilled with instructions, which were going for $15.00.

Ken Grant told us about frying his Spectrum with 15 volts & getting it repaired very quickly by Mancomp of Manchester, UK. Dave Ross still has some Spectrum Roms & Emulators which he might be persuaded to part with. Ian is

looking for a complete 2050 modem board. Jim Horn told us about working on Extended basic & Novram machine language stuff.

At this point somebody (I don't remember who - sorry) told us about taking apart a digital readout bathroom scale & finding a single chip which read a rotating spiral. Ken told us about seeing a similar setup with an SP256 speech chip attached - a clear marketing blunder.

Then Harvey demonstrated his Imagewise video digitizer. He digitized a group picture which might turn up in these pages.

The meeting carried on informally with wild abandon & great glee.

February 12/88 Minutes

-by your humble scribe

The meeting started at 19:20 with your humble scribe not present. This first paragraph is a result of some notes Rod made. A new member Ken Davis was made welcome. Mention was made of the City Link party held Feb. 17/88. It was noted that American Design Computers are now selling the 1500 & the 2040 for US$39.95 each. Ken, the prez for not much longer, also mentioned that next month are elections. To sweeten the coercion, coffe & donuts will be served. There will also be a door prize of some books. Come early & get elected!

There were 23 souls present when I arrived to much fooforah. After the cheering & jibes died down, Gerd B. stood to tell us about a letter from Fred N. & read excerpts. Fred seems pleased with his free ad.

Ken then told us about his coming trip to China & reiterated the fact that he was not going to stand for president again.

Rod stood to make his Editor/Treasurer's report. We currently have approx. CAN$820.00 in ye olde credit union. Rod H. told us about speaking with Rod Gowen [RMG Enterprises] about forthcoming Computer Fest in Portland. Rod G. is looking for speakers & he also explained some of the trimmings this year. There will be tours & clowns to amuse the non-computing members of the family. Affordable accomodations have been arranged. Reserve time on your calendar in early August. Reportedly there will be a sizeable contingent coming up from California.

Rod also made a statement about ZXAPPEAL. He has come to the conclusion that the newsletter should remain monthly, just so that everybody knows what is going on. Unless he is swamped with material, the newsletter will likely be one month thin, one month fat. There seemed to be general agreement that this was a good idea. Now it is up to the membership to swamp Rod with so much material, that the thin months don't arrive.

Rod was speaking recently with Dan Elliot about a Centronics interface which was giving him problems. At this time the question of SCLD chips for the 2068 came up & Dan mentioned he was going to be buying 50 or so. Rod is collecting names of those interested in getting an SCLD chip for US$20.00. This is, as you likely know, the only chip not replaceable off the shelf in the 2068. Rod also mentioned for those wondering, that the Tim Stoddard 16K->64K modification is still on.

Rusty, the VP, stood to tell us that he had Syncware mags for sale yet & 50 QL raffle tickets. He also mentioned that there was a Crown Assets Disposal sale upcoming in Richmond & gave us a fine lesson in the niceties of rigged bidding.

Bill Rutter, the 2068 librarian, is running business as usual. Apparently very many of the Cleveland tapes are turning out to be unuseable becuase of poor tape quality.

Ian McLean, the ZX81 librarian, stood to tell us of his project to put all the past ZXAPPEAL topics in a database. There is note about this project on CityLink [(604)222-2000]; Room 6001: Board 12. [I also want to mention that there is a Sinclair Files section on Frog Hollow (604)469-0264]. He needs to get a copy of early ZXAPPEALs to complete his database. He is getting these from Rod H. Rod also mentioned that the San Francsico user's group has been keeping a similar database for ALL the Network newsletters they get.

The question of getting access to the many Network newsletters we receive was raised. Rod H. is greatly concerned to not lose any issues, while several members felt they had no access. The way it is set up at present, is that if you want to read the newsletters of a certain group, ask Rod & he will give you that complete file.

Somebody mentioned the stock market & there was a lot of talk about computerized trading & crashes & such.

The Hardware SIG rose & swore undying love for the ZX81/TS1000. Then little bits of Harry's secrets began to

slip out. It looks like they are working on a 256K Eprom/RAM Disk with an Eprom burner for the PC8300. The address space overlaps the onboard ROM so it is possible to use a copy of Fred N.'s Eprom in nonvolatile ram! The system uses Wilf's RDOS.

It appears that Ken is having difficulty getting the Skytrain tour together & what with gallavanting off to China and all, it is in the REAL SOON NOW category.

At this point, we were treated with a speech synthesizer demo tape Ken had recived from a California company. This was aimed particularly at the blind user. We heard the DECtalk [US$4000.00], the Symphonics [US$300.00], the Votrax [US$575.00], and Echo [US$275.00]. None of them did Daisy.

The meeting ·dissolved to general mayhem & merriment.

Playing with Electricity

-Feb 21/88 by Harvey Taylor

This month I have a grab bag of topics I have been meaning to get around to. I have wanted to mention the very excellent Scientific American issue October/87 on the next revolution in computers. There are articles on Architectures, Mass Storage, Networks, New chips etc. It is well worth checking out. Also If you are into 68xxx programming, there is a good article in Byte Sept/86 called "68000 Trips & Traps". It has lots of neat little 68xxx optimization tricks. And just to give your preconceptions the old heave ho, there is an article in the Feb./88 Scientific American on plastics which conduct electricity. The last book is a reissue of Computer Lib / Dream Machines by Ted Nelson. This classic first came out in the mid-seventies & it is indicative of Nelson's vision that the book is still relevant. Check it out!

In "QL SuperBasic, The Definitive Handbook" by Jan Jones, who wrote the language & should know, there is a really neat loading trick for the QL described. Let us say you have a downloaded basic program which does not use line numbers, or one of those copy_protected basic without line numbers programs which you wish to load. What you do is this.

On a reset machine, type AUTO & press enter. This will invoke the automatic line numbering function of the QL editor. You will be prompted with 100 and a cursor. Now, [without pressing <CTRL><SPACE>], erase the 100 and type 'LOAD <yourfilename>' [eg. LOAD mdv1_APRG0_bas]. The drive will

begin to run & after a bit you will be prompted with a much higher line number. At this point, hit <CTRL><SPACE> to get out of AUTO & do a listing. You will see the unnumbered program all nicely numbered in your listing. If there is a line which superbasic does not like, there will be the keyword MISTake immediately after the line number. As Jan Jones says, 'Neat huh?'

Some time ago Rod H. published the Savage benchmark program & gave some ZX81/2068/QL results. At the time, I told him I would SuperCharge the program & post the results. The straight QL time is 1m 25s and answer of 2499.712. Incidentally, on the QL it is possible to specify integer variables by affixing % to the variable name. If one does this to the variable A in the listing, the result is 2500 and the time is 1m 27s. A supercharged version of the Savage benchmark came up with a time of 0m 58s and a result of 2499.71218. Supercharge choked on the integer variable version.

I got a letter recently from a chap in Calgary who was having trouble hooking up a monitor to his QL. A lot of monitors on the market, have switches to allow it to accept either positive going or negative going SYNC signals. The problem arises when your monitor does not have such a switch & your QL puts out the wrong polarity of signal. Hooking up a monitor which requires positive going signals involves using a simple inverter to modify the QL signal.

Please refer to the CONCEPTS [Page 33] Section of your QL User's Guide. There is a diagram there of the Monitor connector on the back of your QL (8 pin DIN). CSYNC is the Horizontal Sync. By the way, there are two kinds of 8 pin DIN connectors. The QL uses the "B" style, (Armaco # DD8281).

This manual was written in the UK & things are not all that they appear to be. In particular, the Pin #1 (Composite PAL) is +5 volts. This can be used as the power supply for the chip. The Pin #2 (Ground) is used to complete the power supply circuit.

The chip you will be using (a 74LS14) consists of 6 Schmitt trigger Inverters. Basically you take which ever signal needs inverting (HSYNC or VSYNC) and run it through the inverter & hence to your monitor.

Meanwhile hooking up an ordinary composite monitor is a piece of cake. Just use Composite Video and ground. I also have one of those 5" monitors which requires seperate Sync signals. Inverting the Horizontal Sync with a circuit similar to that discussed above works like a charm.

Finally, I want to add an optimized Scroll method which illustrates a useful technique and mindset. Using the Movem method cuts down the cycles/byte by 4.375. On a screen of 32K this can amount to $4.375 * 133*10E-9 * 32768 = .1906$ sec.

All of the cycle times are listed in the back of the 68000 programmer's reference manual.

****

```
*
* Standard Method
*
SCROLL    MOVE.L   #VIDEORAM,A0
          LEA      (10*128)A0,A1    * 10 LINES OF 128 BYTES
          MOVE.W   #(32768/4)-1,D0  * COUNTER
SCR_LOOP  MOVE.L   (A1)+,(A0)+      * 40 CYCLES
          DBRA     D0,SCR_LOOP      * 18 CYCLES
          RTS                       ─
                             58/4 = 14.5 CYCLES / BYTE

*
* MOVEM METHOD
*
SCROLL    MOVE:L   #VIDEORAM,A0
          LEA      (10*128)A0,A1    * 10 LINES OF 128 BYTES
          MOVEQ    #32,D1           * INCREMENT
          MOVE.W   #(32768/32)-1,D0 * COUNTER
SCR_LOOP  MOVEM.L  (A0)+,D0-D7/A0   * 24 + 16*8 = 152
          MOVEM.L  D0-D7/A0,(A1)    * 16 + 16*8 = 144
          ADD.L    D1,A1            *              10
          DBRA     D0,SCR_LOOP                     18
                             324/32 = 10.125
```

****

Carry on Clive

*I*t has been more than three years since Sir Clive Sinclair last released a machine into the computer market, but judging by the time I have spent using the Z88, the first product released by his new company, Cambridge Computer, he has lost none of his skill or entrepreneurial genius.

Yet again, Sir Clive has ignored what most people consider to be the industry standard, MS-DOS, by producing a machine which at best can be described as idiosyncratic. As if to make some obvious concession, Cambridge Computer has produced some MS-DOS software which allows Z88 users to send and receive Wordstar and Lotus files, but this does not really make up for the lack of software choice.

As with everything else that Sir Clive has been responsible for producing, the Z88 is available in a stunning range of colours; black, black or black. This obvious stylistic criticism apart, the designers of the Z88 have done a good job in creating a machine which is remarkably attractive – if you like yuppiesque matt black.

Having paid your money (more than likely a couple of months prior to the machine arriving on your doorstep) it is somewhat disappointing to receive nothing more than a small briefcase-like package, but once you have extricated the machine, the disappointment soon turns into amazement.

Inside this briefcase is the Z88, together with a large and, at first glance, comprehensive-looking guide to the machine. However much you have read about the machine, little will have prepared you to actually have it sitting on your lap. As someone who has used a wide variety of portables, varying from the original Kyocera based machines, to the recent crop of PC-compatibles, the compactness of the Z88 is a revelation.

With a surface area slightly larger than an A4 pad, and weighing less than a hard back book, the Z88 really is the epitome of portability, and even when it is stored in its case – advisable if you want the machine to last – it will comfortably fit in all but the briefest briefcase.

Compact

In simple terms, the reason Cambridge Computer has managed to produce such a compact package is the lack of any normal form of removable storage. When the first rumours of the Z88 started to leak, most people believed Sir Clive would stick with microdrives, as used in the QL. Like the Psion Organizer, however, the Z88 takes a different approach – RAM and EPROM.

At the front of the Z88 are three expansion slots that can take an assortment of RAM and EPROM cartridges. In everyday use, the RAM is both simple and reliable, but if any really important information is created, it becomes necessary to store it more permanently, and that is where the EPROM comes in. Using a built in EPROM blower, the Z88 can copy files and information from the RAM cartridges straight to EPROM.

This is where one of the first limitations of the Z88 becomes apparent. Although the Z88 can accept anything up to three cartridges, the four HP7 batteries used to power the machine cannot produce enough juice for extended use if the three cartridges are used. Currently, in this Z88, I have 128K of RAM and a 128K EPROM as well, and although the batteries can be made to last well, copying files to EPROM reduces their life considerably.

Dead Flesh

As with most of the other products that Sir Clive Sinclair has been responsible for, the keyboard of the Z88 has come in for some heavy criticism, and at first glance you can see why. Made out of the familiar 'dead flesh' rubber that was used on the early Spectrum computers, it feels lifeless to a first-time user. After a few hours use, however, the keyboard grows on you, and I have found it quite refreshing, especially after many hours tapping away on various PCs. The screen too is a great improvement on some of the recent backlit screens I have used. Showing a total of eight lines (which is surprisingly ample), it is one of the new generation of 'supertwist' liquid crystal displays, in this case produced by the printer giant Epson.

Although the hardware forms the base of the Z88, it is the software that will make or break the machine. Developed in-house, the main part of the software is a generic word processor-cum-spreadsheet-cum-databae called Pipedream.

Quite how they have managed to produce such a complete piece of software is a mystery, but having used all the sections, it is apparent that the software is both well written and, so far, bug free. In use, it is clear that rather than three separate pieces of software, Pipedream is a spreadsheet that has been adapted to be a word processor.

For most of the time this does not prove too much of a problem. As a processor of words, Pipedream allows the user to justify text, set line spacing, set headers and footers, as well as most features Wordstar users will have grown accustomed to. It is when editing previously written documents that the annoying little idiosyncrasies of Pipedream become apparent. Deleting backwards from one line to another is impossible, and cursor movement is confusing to say the least.

If you can be satisfied with the word processing side of Pipedream, then the spreadsheet will come as a revelation. Using a similar format and entering system to such firm favourites as Lotus 1-2-3 and Visicalc, the almost immediate copying and loading from the Z88's RAM means that long and complex tables can be altered and maintained in minutes rather than hours.

Achievement

Where Pipedream excels is for users who combine text and tables to form reports. Unlike programs such as Symphony, data can be changed and recalculated even when it is surrounded by text. Another useful feature for this kind of editing is the novel page map at the left of the screen, which gives the user an accurate picture of how the finished page will be printed.

As well as Pipedream, the Z88 comes complete with a diary, a clock, a calendar, a communications package, file import/export program, as well as an impressively complete version of BBC Basic and a stand alone filing system. All these programs operate with the Z88's unusual menu system which uses the MENU key to pull on to the screen a variety of options.

Technically the Z88 is a real achievement for Sir Clive Sinclair. He has, just as he said he would, released the first truly portable computer that anyone could carry and use constructively. There remain some reservations, however.

The machine is three months late, and so far mine has crashed four times, twice without any warning whatsoever. The exclusion of a parallel port is unlikely to help sell the Z88, even if porting data to other machines is possible (something I would contest having tried unsuccessfully on numerous occasions).

Finally, and perhaps most importantly, the Z88 is to be sold at £290, much more than was originally suggested and, I would suggest, too much to achieve the kind of sales the machine deserves. Yet again, Clive Sinclair has had a great idea, but also yet again, the execution has left a lot to be desired.

✳✳

```
                    POKING AROUND!
                  by Douglas Jeffery
```

I have been collecting all sorts of pokes, hints, maps, and other information for the Spectrum and TS2068. I have finally gotten around to getting it sorted out, and want to pass some of it on.

Most of it is for the Spectrum but the 2068 codes should be easy to find. If you want more info on some of the game hacks, or have some of your own just contact me at; Larch Rd., R.R.#1 Telkwa, B.C. V0J 2X0. I am always looking for more hacks.

```
POKE 23609,100 =Beep at each key
                 touch.
POKE 23692,255 =Auto Scroll
                 (used in program)
POKE 65536- USR7962 =Free

RAND USR 1331 =Exploding Border

RAND USR 51211 =Restarts Flight
                 Simulator after
                 new or stop.
POKE 23756,0 : ENTER :ENTER =Puts
                 first line into
                 line 0.
POKE 23756,n   =Puts line 0 into
                 line (n).
RAND USR 3280 =Scrolls whole
                 page up one line.
RAND USR 3652 =Clears bottom
                 half of screen.
RAND USR 3330 =Scrolls whole
                 page up to line 1
POKE 23617,236 =Prints '?' as
                 cursor for Input
POKE 23755,100 =Listings disap-
                 pear.
POKE 23755,0 =Listings reappear.

POKE 23658,8 =Caps Lock.
```

GAME HACKS

Manic Miner (Bugbyte) Type when game is running 6031769.

(Software Proj.)type TYPEWRITER. A boot will appear at bottom of screen Then hold down 9 and press a combination of keys to jump to rooms. (9-1) (9-13) (9-1234) Write for complete list

Martianoids =Merge loader and add POKE 46926,127: POKE 42812,0: POKE 42815,0 before the RAND USR statement.

Space Harrier =In trainee mode, select keys as normal and when you return to main menu type CHEAT3FB69 and the game starts with you invincible.

Nemesis =Merge loader and enter 56 POKE 51479,1 and you're indestructible.

Sweevo's World =POKE 33219,0 Infinite lives.

Highlander =Kneel down and keep a high block, so that he loses energy when he hits, not you.

I have quite a lot of pokes, hints, and some maps of games and adventures. If you want help with anything or if you have any hints to share, please contact me. If there is enough interest I will try to make a column for the newsletter.

Silicon Mtn. Computers
C-12, Mtn. Stn. Group Box
Nelson, BC V1L 2J3
Canada

ZX-TERM EXCHANGE TAKES OFF!

The ZX-TERM EXCHANGE, a "not-quite-a-SIG" within the framework of the NICOLSON NIGHTIME NETWORK, is off the ground and gaining altitude. So far, we have several never-before-seen programs for the ZX81 in the Files section. Included at this writing are: BLOCKBUSTER and INVADERS (WRX16 high-res); MICRO-MOUSE GOES DEBUGGING (a really cute quasi-hi-res program); "ROCK CRUSH" and "DAN'S REVENGE" (quasi-hi-res shareware from two blokes in Scotland); "TRUCKIN'" and "BATTLESHIP" (neat low-res stuff!)

Also online are RLE pictures, and info files on how to decode them; info files on expanding the usefulness of ZX-TERM*80; and files of general interest.

Much more is to become available in the near future, including programs from Pleasantrees Programming in Arizona, some more of my own programs and tutorial ramblings.

As time goes on, we might become a "real" SIG. If you guys REALLY show that you want it, I'm considering setting up a dedicated CP/M board (perhaps even with hard disk) to "support your habits." However, it depends on you.

The NNN is on-line every night from 1800-0900, and all day Sunday. It uses 8/N/1, and can be reached at (604) 354-4666 (a 3, two 4's, and the "number of the beast).

Many files can be downloaded and used with nothing more than 16K of RAM, and "Mini-Xmodem." Larger files may require 64K (with M1* decoding) and ZX-TERM*80. WRX16 high-res stuff will of course require a suitable static RAM to run.

You don't have ZX-TERM*80 yet? Well, do I have a deal for you. Only $24.95 of your hard-earned Canuck-bucks will bring you this miracle of modern technology. (We'll even accept US dollars at par!)

Drop in and say "hi!"

Fred Nachbaur

9

With the Z88 released to some acclaim, Sir Clive Sinclair is back in business, plotting the future of computer technology. As usual, he is miles ahead of everyone else. But is he too far ahead for his own good?

Sir Clive Sinclair is indisputably the most colourful and influential figure on the British microcomputing scene. Martin Banks and Simon Craven caught up with him at the official launch of the Z88 laptop computer. The Z88 is interesting in itself, but Sir Clive also gave away some fascinating details of how he sees the future of Cambridge Computer, the pocket telephone and the potentially revolutionary wafer-scale integration project.

Why is there no modem fitted to the Z88?

"It's coming along as an accessory, but the problem is that it needs to be a different unit for each country we sell in. In this country there is also a delay for BT approval."

What about comms software?

"There is some comms software already built into the machine. That gives you enough to log on to something like Telecom Gold. If anything else is needed in the future it can always be loaded into the machine where it will stay resident even when the Z88 is switched off."

Earlier computers from the Sinclair design stable have sometimes been accused of poor reliability, and Cambridge Computer's publicity effort is placing heavy emphasis on the quality of design and construction in the Z88. Has there been a significant return rate on the computers delivered so far?

"No we had a few back, about six, with a keyboard problem in the early stages, but that's all the trouble we've had."

You have announced distribution deals with Dixons and Comet. Will these be the only outlets now that you have stopped mail order sales?

"No. The general trade will be served by other distributors. I can't name any at the moment, but we are in negotiation with several and expect to appoint at least two."

Cambridge Computer sells software to transfer files between the Z88 to the IBM PC. At the moment, Wordstar and Lotus 1-2-3 are supported. Are there plans to implement file transfer to other software or hardware environments?

"Yes, a Macintosh package is under way, and as for others we'll look at them in the light of demand from our customers. It's worth remembering that there will be a healthy market for third-party manufacturers of add-on software and hardware for the Z88. A third-party communications pack for Z88 to BBC micro is one example which should appear shortly."

We've heard that someone is working on an Amstrad-Z88 pack, too.

"Which is fine. That's the sort of thing we are happy to encourage."

One possible application for the Z88 is data capture. Do you have a suitable bar-code reader?

"Not ourselves, but that's certainly the sort of product which we envisage being plugged into it. A lot of that sort of thing will come from other companies – we have no wish to monopolise the market."

The machine uses EPROM cartridges for mass storage. With conventional disks one advantage you have is that you can carry out a selective random-access purge to clear out your unwanted files. With the Z88 cartridge you can only erase the whole content at once.

"Yes, but that's not a problem because you use it in a different way. You take an EPROM with a lot of stuff on it, put it into the machine, dump the whole lot to RAM, delete the files you don't want, wipe the cartridge and save it all out again. The wipe process only takes about 12 seconds, which is pretty fast for EPROM. When you get up to a megabyte on a cartridge we are going to use PROMs which you can't erase yourself, though you can send them back to us to be wiped. The reason is that we expect people to use the megabyte cartridge like a hard disk. It is essentially for long-term archival use. People don't generally delete things from their hard disks – they just dump things to them."

Will you limit the future capacity of the cartridges to 1MB? If not, how will you manage the directory problem?

"We don't need to limit the capacity. The current 1MB cartridges have a 1MB direct addressing range. There's no reason why you shouldn't have more than 1MB in there, but as with a hard disk, you will have to tell the machine which page you want to look at."

Cambridge Computer is at present a single-product company. Will there be other Cambridge Computer systems in the future?

"Very much so. Not other portables, because we see the Z88 as being sufficient for as far into the future as we can see, because it's flexible and you can add things to it. But we are looking at the computer field in general to see what else we can do."

Cambridge Computer seems to have a very different character from Sinclair Research, in its target user base at least. The intended user of this machine is very different from the buyer of a ZX80, ZX81 or Spectrum.

"In a way, yes. The original idea behind the ZX80, 81 and Spectrum series was to get into the idea of teaching people about computers and what they could do. We realised the games thing would happen, but we never expected it to take over, which it did. We didn't plan that at all. It became the dominant side of the business, but what we had always wanted to do was get into the business of making usable computers which would help people. That's what we have done with the Z88, so in that respect it is an expression of where Sinclair Research was going. Now we've reorganised ourselves so that Sinclair Research is purely a holding and research organisation and Cambridge Computer actually handles the products."

How much of the concept of the Pandora project is carried over to the Z88?

"Well, the basic philosophy is very similar, but when it came to the design we started from scratch with a clean sheet of paper. It was lucky we had that opportunity, because we were running up against a brick wall at that point. The display technology on Pandora was a flat screen similar in concept to the pocket television, with an optical system to blow it up to a decent size. it was very good, but it couldn't quite give us a display 80 characters wide. We went up to about 66

characters but couldn't do any better. We were just lucky that the supertwist LCD technology came along when it did."

Is it possible that some of that abortive flat screen technology might spill over into a third version of the pocket television set?

"No, we have no plans in that direction at the moment. I'd like to do a new pocket TV but the fact is that it has not proved to be a big market."

Why do you think that is?

"It's very odd. Pocket radios have always been big sellers, but pocket TVs have not. I can only suggest that watching television is not something that people do on the move."

Maybe because it's more interactive, diverts more of your attention?

"Possibly, but it certainly isn't a big market."

What are your hopes for your telephone project?

"Shaye Communications has a 25 per cent stake in that project, and the product should be out next year. It's a dramatic breakthrough, but that's about all I can say at the moment."

We understand that the real success of that product will be dependent on the siting of terminal stations at places like railway stations, airports and the like.

"That's one way of going, but you can use it through a black box which connects it to your office switchboard, or through a different black box which connects it to cellular radio. you have a little pocket phone, smaller than your little dictation machine there, weighing about three ounces. you are then free to buy the interfacing black boxes. One connects to the office PABX. Everyone in the office has the little handsets and they can use them just like ordinary telephones. They can call each other or dial out of the building without even thinking about it. You could then have another black box in your car which enables you to dial out from there on the cellular system. You use the same telephone, without having to think about where you are and what system you should use. When you get home you can keep on using the same phone because you have a black box in your house. So wherever you are you use the same phone in exactly the same way, and it automatically polls around the available black boxes to place the call as cheaply as possible. It's completely user-transparent."

How many calls can one of your black boxes handle at any one time?

"A lot. It's about 100, all time-sliced."

That's a good number when you think of the queues at railway station telephone boxes. Will it have a significant cost advantage over existing cellular phones?

"The phone itself is considerably cheaper, but it doesn't do the same job. If you bought the cellular black box as well, the cost would work out about the same as a conventional unit. There's no reason for it to be much cheaper."

What is the latest news on your wafer-scale integration project?

"It's going very well. That company, Anamartic, should be announcing its capitalisation soon and we expect to see products out next year."

What process are you using?

"The first wafers, the ones due out late next year, will be CMOS, but we are working on our own process which should appear in two to three years' time. That will be bipolar technology, which is a very dramatic change. I worked out some years ago that you had to go bipolar, and the world is now starting to realise that. Bipolar CMOS is starting to appear, but what it really takes is true bipolar design. There are fundamental theoretical reasons why bipolar is better. What really matters is how much voltage you have to put into a transistor to switch the capacitors. A bipolar transistor is ten or twenty times better in that respect."

How long does the initialisation process take when the wafer is powered up? Ivor Catt's designs back in 1978 had serial registers, and they were doing a three-cornered search for valid memory.

"It's the same principle. They are blocks of RAM instead of serial memories and they do a three-cornered search. It takes a tiny amount of time to initialise – less than one second to map out the wafer. And whereas Ivor's original idea was to power up the wafer every time you used it, we don't do that. We initialise it once and then it stays live. You could power up again if you ever had a failure – there's a detection process – but we built in two additional levels of redundancy over and above the original Catt concept. There's an error code correction and a system whereby you can use a partial block. If one of the blocks of RAM doesn't work completely you can still use it. It maps the faults and works around them, just like a disk formatting program. So the chance of a significant failure is

very low. I've forgotten the mean time between failures but it's huge. That's one reason we're going to sell them. The speed is terrific, of course, but the reliability factor is very important.

In the long term are you thinking of other types of memory, such as EPROM?

"I don't know how much thought Anamartic has given to that, but I am very much interested in other sorts of memory. EPROM excites me because it requires zero power when the computer is switched off, whereas for the RAM we have to use battery back-up."

You have always had an interest in alternatives to standard media such as disks, and the idea of a nice convenient cartridge with ten or twenty megabytes of capacity is obviously attractive.

"Yes, I think solid state has to dominate. I have never believed that disks were the best way to go. For a long time, of course, they were the only possible way to go."

But so far disk technology has always managed to beat semiconductor technology. A few years ago bubble memory was supposed to be the great disk replacement, but that didn't make it.

"So far, yes, but that has changed now. The Z88 is an example of a machine which has no need at all for disks. I can't mention any names, but one of the big computer companies has a stake in Anamartic, and the reason is that they are going to change over from disk to semiconductor storage.

Is that Tandon?

"I'm not allowed to tell you. But there is no doubt whatsoever in my mind that the whole computer world will change over – not overnight, but it will happen."

How long do you expect it to take?

"Some years. It depends on need and on who is doing it, but faster than you might suppose."

Presumably this technology has a bearing on the future of the Z88.

"Sure, it means that eventually we will be able to have multi-megabyte cartridges using only one chip. At the moment we have six-inch wafers under development, but they are designed so that they can be cut down into whatever size of package we want."

What is the likely cost of a wafer memory?

"At first it will be several times the cost of the equivalent Winchester storage, but it will decline faster than the per-bit cost of the hard disk. Of course, it will

11

HEADER HACKER (PART I)
— BILL RUTTER

I became interested in hacking after seeing various Pokes published to modify programmes (particularly Arcade Games) to give extra Lives, Time, Ammo., Srength etc. The problem arises when a Basic Loader is not given, and one has to break into the program. This problem resulted in looking into methods of Software Protection used to prevent pirating, and Part II will review some of the most used. As I am not a machine code programmer this will be a fairly elementary review.

All cassette based programs start with a Basic Loader, and are in machine code. Therefore it becomes necessary to to be able to List the header as the new Pokes are always put into listing just ahead of the final PRINT USR x, or RANDOMISE USR x, instruction. Unless the start is made with LOAD""CODE, try to MERGE "". If the O.K. report is shown and the header lists, no problem. However if the screen is blank along with an O.K., alter the PAPER colour, (then LIST) as both PAPER & INK may be the same. If this fails, and the screen appears to 'hang', other tricks have been used. If the header is in Basic, but has been made invisible by some means, the following m/c routine may work. RUN the listing, then SAVE as "hacker"CODE 32994,89. To use this, LOAD "" CODE, then press CAPS SHIFT & ENTER together. Then MERGE "" the program, instead of LOAD"". This may stop the header and you can LIST it. Adapted from Spectrum Arcade Handbook, Issue 8.

```
10 FOR n=32994 TO 33082: READ a:POKE n,a:
NEXT n
20 DATA 62,63,237,71,237,86,201,62,128,
237,71,237
30 DATA 94,201,127,32,74,111,110,32,78,
111,114,116
40 DATA 104,32,56,54,161,1,129,245,62,
254,219,254
50 DATA 31,56,7,62,191,219,254,31,48,4,
241,255
60 DATA 237,77,42,178,92,43,249,43,43,
34,61,92
70 DATA 175,50,113,92,205,1,22,205,
110,13,33,59
80 DATA 92,203,158,35,203,238,175,17,
239,128,205,10
90 DATA 12,251,195,169,18
```

Alright, alright. You twisted my rubber arm. So you want to know how it came about that I got involved (for better or worse) with "the poorest excuse for a flyspeck computer ever made," as our beloved Zeeper so affectionately phrases it. Well, like the Dormouse's, mine is a long and sad tale.

You think we've got it rough, eh? Well let me tell you that the ol' ZX is a dream-come-true if you had any exposure to mainframes in the '60s. I wrote my first program in Fortran on the O.S.U. mainframe back in '69. It was a simple program, it only did some formula crunching to figure resonance and Q of tuned circuits. But it took WEEKS to debug. Mass storage in those days was on paper cards, one command per card. It was a real luxury to use the paper-tape reader to make a somewhat more compact version of my listings. When submitting a program for running, one was lucky if the hard-copy results came back the same day. One was even luckier if it actually ran, and didn't just come back with some obscure error, coded in such a way as to make it virtually impossible to locate.

Computers? You can keep 'em. I can find a square root "the hard way" faster and with less trouble than using this alleged "miracle of modern technology." Of course, back then every self-respecting science nerd carried his 12" slide rule from his belt wherever he went, so if you really needed the arctan of 1.343 while waiting for the bus, a deft flick of the slipstick would give it to you pretty as you please.

The computer bug finally bit again in 1980, when I scraped together some nickels and dimes to buy Radio Shack's (actually Sharp's) first pocket computer. This thing sported a full 1.8K of non-volatile RAM, had a nifty resident BASIC, and even had a little printer and cassette interface. But talk about slow!

Even so, it wasn't long before I was doing Fourier Analysis and playing Blackjack with programs I had written. The Fourier stuff was interesting in that, because of the limited RAM, I had to use the cassette tape "chaining" option to load in every subroutine as it was needed. It was fully automatic, mind you; it turned the motor on as required to load the next module. A 200-point, 40 harmonic run took a week.

It was during such a run that someone broke into my house and stole the whole "system." The buggers didn't even have the decency to run off hard-copy of the current run before taking it. Drat. Guess I'll have to buy another one.

But wait! What's this? Pop Science has this ad for a real computer for only $150? Built in 1K of RAM, and expandable to a colossal 16K! Machine-code capability too! That's GOT to be too good to be true. Chances are, it'll be a waste of money akin to the plans for "cosmic ion pain field zappers" that have graced the rag ads for years. But ok, I'll bite. It certainly can't be one of the more foolish things I've ever done.

Or was it? The rest is, as they say, history. Starting with a severe phobia of digital electronics, and the firm conviction that machine-code is only understandable by math Ph.D's, I worked my meandering way from computer illiterate to computer obsessive. Or, I should say, ZX obsessive. Computers? You can keep 'em. I have yet to find an application that my high-tech doorstoppers can't handle.

One of the least publicised advantages of the ZX (and family) is that it helps to teach the virtue of patience. If I were to reflect on how many times an abrupt crash has ruined hours of work, I think I'd have a breakdown. So I don't think about it. Instead, I pick up whatever pieces might remain, ponder certain despicably dastardly deeds, but resist the urge to execute them, and try again.

All in all, it's been a lot of fun. I've learned a thing or two, and tried to do my part to prove that real computing can be done on a machine far less complicated than my photocopier, let alone my CD player. Or even the average microwave oven.

I still tip my hat to Clive Sinclair for the ZX81. I must admit, though, that I feel he must have simply lucked out on this one. He hasn't come up with anything significant before or since then, has he? (I mean as an inventor, not as a comedian.) Timex is another slapstick burlesque. Had they come out with the '1500 right off the bat, and given the ZX81 (aka TS1000) the decent burial it so richly deserved, they might still be in the land of the living. Had they not bastardized the Spectrum beyond recognition, they might even be making money. Oh, well. It's their loss.

So, still blissfully unaware of the real computing world, I continue to hack away with my "rubber rinky-dinks" as one correspondent disparaging called the '1500. I write millions of words per year, explore the furthest reaches of modern fractal mathematics, write and play complex and sophisticated adventure games, look at pretty graphics, telecommunicate, even diddle around with hi-res color (8x as good as the 2068, by the way) on occasion. Computers? You can keep 'em. Zeepers, blow it out your IBMs.

Fred Nachbaur

Timex, Sinclair, and the Clones

David H. Ahl

At the Winter Consumer Electronics Show in Las Vegas, there was much fanfare surrounding the official introduction of the Timex/Sinclair 2000. Dan Ross, Vice-President for Computer Products, and the entire Timex crew were there as well as Clive Sinclair and Nigel Searle from Sinclair Research in Britain. On a much lower key, a Sinclair clone and a look-alike that ran Forth were shown by smaller companies.

We've told you about the 2000 (Sinclair Spectrum) in previous issues of *SYNC*, so before looking at the other new hardware, let's hear what Dan Ross has to say about marketing. Today, about 14,000 retail outlets are carrying the Timex/Sinclair 1000; Dan expects that number to increase to 25,000 or more by the end of 1983. Catalog showrooms, toy chains, and bookstores are all in Ross's sight, but he also plans to target other channels of distribution, most notably schools and banks.

By June or July, says Ross, several programs will be instituted between Timex and different banks. He thinks that banks will be rushing to give away the 1000 as a premium for opening new accounts, especially when Timex introduces a $99 modem (expected in the first quarter of 1983).

Ross feels the modem is important because banks are very interested in developing at-home electronic banking services, but the terminal cost thus far has been prohibitive. A computer/modem combination with a list price of $185 could change all that.

Like Apple, Atari, and Tandy, Timex sees the educational market as having a vast, untapped potential. Our opinion is that Timex might be underestimating the amount of software, courseware, and handholding support that is necessary to get into the educational market in a major way. Time will tell.

How many Timex/Sinclair 1000 and Sinclair ZX81 computers have been sold? Of course, the number is a moving target, but as of the end of 1982, our best estimate is 600,000 Timex/Sinclair 1000s, and about the same number of ZX81s, although only 200,000 of them are in the United States.

Does that make the Sinclair the best selling computer in the world? We think so, and Clive Sinclair and Dan Ross certainly agree. However, both Commodore and Texas Instruments also claim to be number 1 in sales. Commodore people were telling everyone in sight at CES that they had produced one million Vic 20's, while TI people were just saying the 99/4A was the best seller, period. No matter who you believe, 1983 should shape up to be a most interesting year.

This year will be interesting for many reasons. First, with *Time* magazine endorsing the personal computer as "Machine of the Year," the home computer gained respectability and urgency in the minds of millions of consumers. Second, as more people enter the market as consumers, volume goes up and prices come down. But beyond the effect on prices, more customers mean that manufacturers will offer a wider diversity of peripherals, software, and applications.

In addition to the many new peripherals and software packages at CES of interest to Timex and Sinclair owners, two new computers were announced. The first was a clone of the Timex/Sinclair 1000 with the main difference being a "real" keyboard. Well, it doesn't exactly have a typewriter keyboard, but rather little rubberized "Chiclets." Dubbed the Futura 8300, it was being shown in the Unisonic booth.

I spoke with the Chinese designer of the Futura and asked him if the Basic was licensed from Sinclair. All of a sudden, his English seemed to falter, but he quickly recovered, shrugged and asked why it should be licensed. Why, indeed? I'm not sure, but it seems to me that it should be.
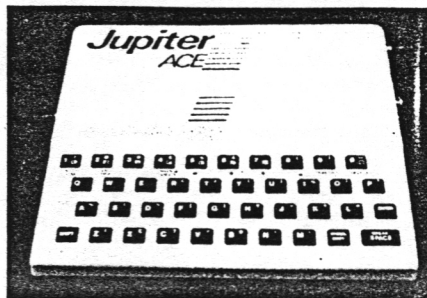
The Jupiter Ace
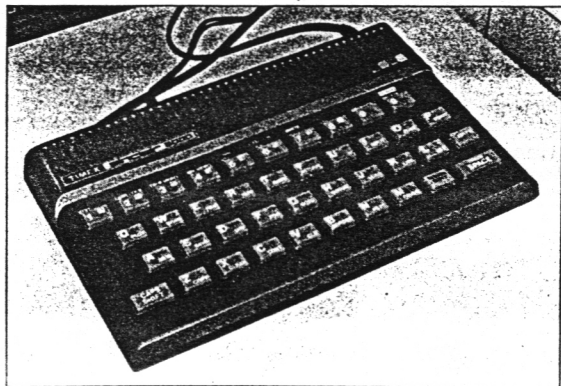
The Timex/Sinclair 2000

The Unisonic Futura 8300

I then went to find someone from Unisonic who could tell me when the machine might be marketed, how we could get one for review, and so on. "We don't have anyone to deal with the press," I was gruffly told. "How should I go about getting one?" I asked, reminding the gentleman that we published *SYNC* and *Creative Computing*. "Buy one," he said as he walked away to find someone else to insult. Although Unisonic is a strict orthodox Jewish company and presumably its employees have had a fine upbringing, we have been singularly unimpressed with their courtesy and product support in the past. Thus, we do not have high hopes for the Futura 8300, even at the suggested retail price of $80.

Another computer which also looked like a T/S1000 with a real keyboard was the Jupiter Ace. Unlike the T/S machine, the Jupiter Ace speaks Forth, a powerful language that adherents claim is ten times faster than Basic, four times as compact, and much more flexible.

The Jupiter Ace has a Z80A microprocessor, 3K RAM, a 40-key keyboard with auto repeat, graphics resolution of 64 x 46 pixels (which the designers claim to be equivalent to 256 x 192 pixels), an internal speaker, a cassette interface, and an expansion port for memory and other peripherals.

The machine will be marketed by Data-Assette, 56 South 3rd St., Oxford, PA 19363, (800) 523-2909.

Yes, there was a great deal more of interest at CES and we came home from the show with armloads of literature, decks of business cards, and scores of promises to send products for review. You'll see it all on these pages.

✳✳✳✳✳✳✳✳✳✳✳✳✳✳✳✳✳✳✳✳✳✳

...con't from pg 11.

always have a big advantage in performance – wafer scale memory is about a thousand times faster in terms of access time."

Everyone else in the semiconductor industry seems to have discarded the idea of wafer scale integration. What have you got that they haven't?

"The difference is that they have had a hardware approach to the problem. They were trying to use fuses, or antifuses, to link the bits. That's a desperately bad idea, because if you make one slip you've had it. Ivor Catt, and him alone, decided to do it with software, using a soft interconnect and the three-cornered search to see which bits are usable. It's

taken a huge amount of effort to make it work, but Ivor is marvellous. He is a classic inventor. Now we have other companies coming in, the big companies who don't take an interest unless it works."

Do you envisage applications for wafer-scale integration outside the field of memory?

"I started the whole thing because I want that technology for supercomputers, and that's what I'm still interested in. Obviously we will use it for memory; so will everyone. But that's not why I started it and that's not what excites me."

**What excites you? The idea of a wafer full of transputers?**

"Absolutely. Real array processing. Years ago I was in the States and I realised the future of computing had to be parallel processing. I had one of those brainstorms we all have and thought 'Christ, we'll never do it!' The pin-out problem alone will kill it'. Wafer scale integration is fundamental. it's not an option – it's a necessity. So I came back and started it, got hold of Ivor Catt and started the whole process."

So that's the long term goal for Sinclair Research and Cambridge Computer. A Cray on a desktop.

"Absolutely. That's the real stepping-stone."

Martin Banks adds:

The thing that strikes me about Sir Clive is that he can actually see far too clearly, far too far into the future. And he's dead right. Disk technology is getting horrifyingly anachronistic. The mechanical technology of a hard disk drive is fearsome. I take my hat off to disk drive manufacturers that they can make it work at all, never mind reliably. But it's going to be around for years and years because there are so many people using it. He's absolutely right, but it wouldn't surprise me if it takes until the turn of the century for him to be proved right. I would like to see it happen much sooner, because non-mechanical mass-storage has to be the way to go.
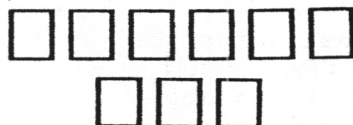
Having been brought up on the tail-end of an old education system, where electronic calculators and computers were forbidden and slide rulers were the norm, I was very apprehensive about purchasing an electronic calculator let alone purchase a computer. So, back in 1981, when an ad in a electronics magazine tried to convince me to join the "computer age" by purchasing an inexpensive British computer for the "common man", I pondered a long while before finally giving in.

I received my ZX-81 in kit form. I assembled it during a long weekend. I was mad about for all of five weeks. Then I stashed it in my closet and went back to my slide ruler. I eventually gave it away to a relative a year later.

After I had learned a bit about microprocessing units in the Service, my attention returned to ZX-81 when I found and purchased a T/S 1000 with a box full of software and books for the sum of $50. Since, I've have purchased another from BUY & SELL. I also have a ZX Spectrum + that I had purchased in Britain; but, until I receive a corrected ULA chip, it's not functioning.

I am interested in programming, but my main interest is in using the T/S 1000 as a controller. At present, I am trying to use one of the machines to control a motor for a telescope so I can track stars for some astrophotography. I tried interfacing my old slide ruler, but logarithmic time does not track stars to well.

15

THE ULTIMATE ORPHAN?

Fred Nachbaur

How would you like a dirt-cheap computer system that has a real keyboard, high-res (256*192) or very-high-res (640*256) screen display, runs fast, has oodles of memory (typically 256K), hardware options up the gazoo, and firmly yet gracefully thumbs its nose at Big Blue?

What if this computer had TONS of public-domain software and shareware available for it? What if there were literally volumes of support literature available?

Well, if you're a true-blue ZX fancier with a greater-than-average touch of the Scotsman (or Bavarian), then read on. Such computers are almost literally there for the taking!

I'm talking about CP/M, the most popular operating system available before IBM decided to force its own (in my opinion far inferior) "standard" for disk operating systems. In the aftermath of IBM's idea of a Brave New World, literally thousands of beautiful CP/M machines have acquired the status of "computer orphan."

I just picked up an Epson QX-10, with built-in dual 5-1/4" drives, high-res monochrome monitor, detachable 105-key keyboard, 256K of RAM, the most current version of CP/M, VALDOCS software, plus ZIP D-BASE, MULTIPLAN, and several other titles. The machine has a direct plug to Centronics printers, an RS232C connector, even a light-pen input. I could go on and on.

The software, especially VALDOCS, is simply phenomenal. I have NEVER used a better word-processor, and I've used quite a few. But it's much more; it has a built-in spreadsheet, communications package (which will even answer the phone for you, so could be used as a rudimentary BBS), appointment/calendar program, and file manager.

This whole package cost several thousand dollars a few short years ago (1983, to be precise). I'm embarrassed to tell you what I paid for it, like-new, in the original packaging; suffice it to say that my cost was well under 10% of the original retail price.

So if you're ready to advance to a "real" computer, one with all the modern conveniences, but still find $1000 a little steep for a box of pretty beige plastic that comes with nothing more than the klunky MS-DOS, consider CP/M. Look around. The bargains are there for those wise enough to see them!

ZX81/TSXXXX OUT-BOARD REAL-TIME CLOCK
by Tim Stoddard

The following is a description of the Real-Time clock section of the D.A.M. board article which appeared in *Time Designs Magazine* (March/April '87 page 23). The board features a full-function real-time clock with battery back-up and is mappable into eight I/O port blocks. See attached schematic diagram.

8255 PPI

The 8255 PPI is used to interface the MSM5832 clock to the Z80 buss. This is needed because the MSM5832 is too slow of a device to attach directly to the Z80 buss.

The 8255 has three ports called "A", "B", and "C". The module uses port "A" to xfer data to the MSM5832, port "B" to select the proper register in the MSM5832, and port "C" to toggle the control signals to the MSM5832. These three ports are accessed by writing or reading one of four registers in the 8255. Port "C" is also bit-addressable by writing a special code via the CONTROL register. This allows us to toggle a single control signal to the MSM5832 without having to "remember" what state the other three MSM5832 control signals were. The following is the table showing which registers control what in the 8255:

REGISTER	PORT
0	A
1	B
2	C
3	CONTROL

The first action that should occure in your BASIC or machine language routine is to initialize the 8255 by clearing port "C" and then setting up the 8255 to write, or read the MSM5832 clock chip. This is done via register 3; the CONTROL register. To write to the MSM5832 you need to initialize the 8255 so that ports A,B, and C are all "output" ports. This is done by writing the control register in the 8255 with an 80_{HEX} (128_{DEC}). To read the MSM5832 we'll need to initialize the 8255 so that port A is an input port and ports B, and C are output ports. This is done by writing the CONTROL register in the 8255 with a 90_{HEX} (144_{DEC}). A one-time action after powering up the computer is to initialize the 8255 (to read or write the MSM5832) then "clear" port "C" by writing a ZERO to register 2. This resets the active-high control signals HOLD, RD, and WR to the MSM5832, and causes the MSM5832's CS to go active via the inverter.

The 74HC138 is used to select a "block" of I/O ports to be used with the clock module. The HEX address of the ports always end in 3, 7, B, or F. So if the 74HC138 is strapped

for "block five", the I/O ports would be 53, 57, 5B, and 5F for 8255 registers 0, 1, 2, and 3, respectively. The following table summerizes the relationships:

8255 PORT	8255 reg ADDRESS	TIMEX HEX	DEC	MSM5832 FUNCTION
A	0	53	83	DATA port
B	1	57	87	REGISTER ADDRESS port
C	2	5B	91	CONTROL port
CNT	3	5F	95	----------------------

The above table assumed a "block" of 5. You can re-strap to any of the eight blocks to avoid conflict with other devices attached to your computer.

We use a special function in the 8255 that allows us to change single bits in port "C" rather than "remembering" what all the bits should be in port "C". This is done by writting a special code via the 8255's CONTROL port $5F_{16}$. The syntax of this code is as follows:

D7	D6	D5	D4	D3	D2	D1	D0
0	0	0	0	X	X	X	SR

```
                        \            /  1 = SET
                         \ SELECTED /   0 = RESET
                          \  BIT   /
                           000 = 0
                           001 = 1
                            etc.
```

MSM5832 CLOCK CHIP

The following table describes the various registers in the MSM5832 and their limits:

REGISTER ADDRESS	COUNTER	DATA I/O D3	D2	D1	D0	LIMITS	NOTES
0	S1	X	X	X	X	0 - 9	1
1	S10		X	X	X	0 - 5	1
2	MI1	X	X	X	X	0 - 9	
3	MI10		X	X	X	0 - 5	
4	H1	X	X	X	X	0 - 9	
5	H10	+	+	X	X	0 - 2	2
6	W		X	X	X	0 - 6	3
7	D1	X	X	X	X	0 - 9	
8	D10		+	X	X	0 - 3	4
9	MO1	X	X	X	X	0 - 9	
A	MO10				X	0 - 1	
B	YR1	X	X	X	X	0 - 9	
C	YR10	X	X	X	X	0 - 9	

(1) Register set to zero when written to.

(2) D3=1 for 24hr or D3=0 for 12hr clock
D2=1 for PM or D2=0 for AM

(3) Days from Sunday. Sunday = 0, Monday =1, etc.

(4) D2=1 for leap year.

The following is an example showing how to read the day of the week from the clock module. Assume the module is mapped in block #5 (ports 53, 57, 5B, 5F).

(1) After powering up the computer write a 90_{16} to the 8255 CONTROL port, $5F_{16}$. This sets up the module to read the MSM5832 clock chip.

(2) As a one-time operation clear port "C" in the 8255 by writing a 0 to port $5B_{16}$. This need only be done one time after powering up.

(3) Write the desired MSM5832 register address to port "B" of the 8255 by writting a 6 (6 = day of the week)to port 57_{16}.

(4) Strobe the MSM5832 RD signal active by writting a $0B_{16}$ to the 8255's CONTROL port $5F_{16}$.

(5) Read the day of the week by executing an input instruction on port 53_{16}.

(6) Return the MSM5832 RD signal inactive by writting a $0A_{16}$ to port $5F_{16}$.

(7) You can now read any other MSM5832 register by following steps 3, 4, 5, and 6 using the desired MSM5832 register address in step 3.

To change the day of the week to Saturday (6):

(1) Initialize the 8255 to write the MSM5832 by writting an 80_{16} to the 8255's CONTROL port $5F_{16}$.

(2) Select the day of the week register in the MSM5832 by writting a 6 to port 57_{16}.

(3) Latch the new day of the week in the 8255's port A by writting a 6 (Saturday) to port 53_{16}.

(4) Store this new data in the MSM5832 by toggeling the WR signal. This is done by writting a $0D_{16}$ to port $5F_{16}$. Then imediately follow by writting a $0C_{16}$ to port $5F_{16}$.

(5) You can now change any other MSM5832 register by writting the new register address to port 57_{16}, latching the new data via port 53_{16}, and toggling the MSM5832's WR signal as in step 4.

...schematic will be printed next month.

VAPORWARE
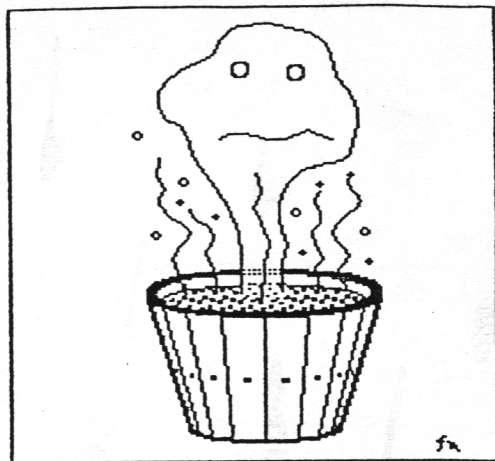
... From SILICON MOUNTAIN

Now that our SCRAM board is available and off the "vaporware" lists, we felt a need for new entries. We're presently taking orders for the following "new" products which definitely will maybe appear one day.

NERD-WORD

- The word-processor for the compleat idiot. Revolutionary input routine obsoletes the mouse, joystick, light pen, trackball, and even the keyboard! You don't even have to know the QWERTY keyboard! Alphabet and control icons continuously scroll across the MCPW (Master Control Panel Window). When the desired character is in the CSF (Cursor Selection Field), press the button on our DBI (Doorbell Button Interface) [only $235.90].

DEBASED

- The file manager of the future! Uses the same input routine as NERD-WORD. Amazing new sort routine; simply print out your files, cut them up, and sort by hand (free tutorial included). Then use our Laser Wand (only $695.87) to read the sorted files back in!

MAIL-PURGE

- Interactively links NERD-WORD and DEBASED. Comes with a pair of scissors and a glue stick for inserting your datafiles into text files. Our patented KAMIKAZE routine eliminates the need for a DELETE function; when the program figures that you've had your files long enough, it assumes that you're tired of them and automatically purges them without saving. Even wipes out the program and gives you an op-art crash-screen!

BUGS-PUNNY

- The ULTIMATE computer game. You are supplied with 16K of pure machine-code; however, the bytes are completely scrambled. Your challenge is to arrange them into a working program. WE don't even know what the final program does! Comes with a packet of instant coffee, a box of double-stuf Oreos, and a pocket bottle of Extra-Strength Excedrin. We'll even PAY YOU $10 if you send us a working copy of the solution!

BUT SERIOUSLY...

We DO have several innovative software titles for your ZX81, TS1000 or TS1500. Send two IRC's for free catalog.

SILICON MOUNTAIN COMPUTERS: C-12, Mtn. Stn. Group Box Nelson, BC V1L 5P1 CANADA
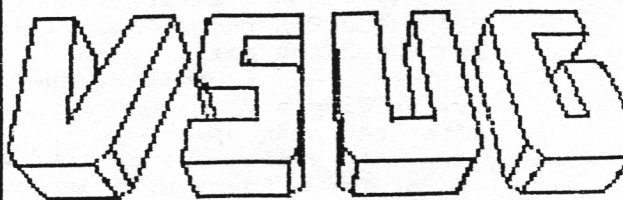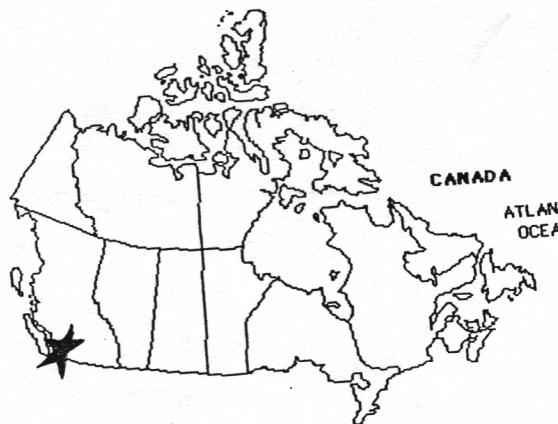
The Vancouver Sinclair Users Group has been in existence since 1982. We are a support group for the owners and users of all SINCLAIR and TIMEX computers

Pres:- Ken Abramson PH. (604) 438-7740
V/Pres:- 'Rusty' Townsend
Sec:- Harvey Taylor
Treas. & Editor:- Rod Humphreys

Our membership dues are only $15.00/year and may be sent to the Treasurer:

Rod Humphreys
2006 Highview Place
Port Moody, B.C., V3H 1N5

Members of VSUG receive a monthly issue of ZXAppeal - our newsletter.

ZXAppeal accepts advertising. Our **PREPAID** rates are:

$20.00 -- full page
$12.00 -- 1/2 page
$8.00 -- 1/4 page

ZXAppeal has a print run of 75 copies per month for members and is distributed to approx 40 other SINCLAIR User Groups throughout North America as well as overseas via the NETWORK.

NETWORK correspondence may be directed to the Editor at the above address.

All articles appearing in ZXAppeal may be reprinted by other T/S User Groups as long as credit is given to the author and VSUG.